ORIGINAL ARTICLE

Gundogdu Cemal[1]
Celebi Evrim[2]
Ozge Beyazcicek [3]
Ersin Beyazcicek [3]
Tufekci Sakir [1]
Özmerdivenli Recep [3]

[1]Inonu University Physical Education and Sports School, Malatya, Turkey
[2] Firat University Health Science Faculties, Elazig, Turkey
[3]Duzce University Medical Faculty, Duzce, Turkey

Corresponding Author:
Recep Ozmerdivenli
Duzce University Medical Faculty, Department of Physiology, 81620, Duzce, Turkey
Phone: +903805421416
Email: rozmerdivenli@hotmail.com

Received: 22.12.16
Acceptance: 29.02.2017
DOI: 10.18521/ktd.280117

Konuralp Tıp Dergisi
e-ISSN1309–3878
konuralptipdergi@duzce.edu.tr
konuralptipdergisi@gmail.com
www.konuralptipdergi.duzce.edu.tr

The Determination of Opinions of Triathlon Athletes on Doping and Anti-Doping Matters

ABSTRACT

Objectives: This study aims to determine the knowledge of triathlon athletes on the types of doping used in sports as well as their opinions on the anti-doping matters.
Methods: This descriptive study was conducted with 92 individuals participated in Taşucu Triathlon and İstanbul Salcano Triathlon Series, which was organized in 2015 by the Turkish Triathlon Federation. A questionnaire was used to collect data. Chi-square test was used in analysis of the data. Corticosteroids, masking agents, anti-estrogenic agents, beta blockers, and cannabinoids were among the types of doping which were least known by the triathlon athletes. These were followed by peptide hormones, narcotic analgesics, anabolic-androgenic steroids and stimulants.
Results: Approximately two thirds of triathlon athletes consider that knowledge of athletes, coaches and administrators on doping is not sufficient.
Conclusion: The majority of the athletes participated in the study stated that the relevant institutions and organizations are not fighting against doping adequately.

Keywords: Triathlon, Triathletes, Doping, Anti-Doping

Triatlon Atletlerinin Doping ve Anti-Doping Konusundaki Görüşlerinin Belirlenmesi

ÖZET

Amaç: Bu çalışmanın amacı, triatlon atletlerinin sporda kullanılan doping türleri ve anti-doping konularındaki bilgilerini belirlemektir.
Metot: Bu tanımlayıcı çalışma, Türkiye Triatlon Federasyonu tarafından organize edilen Taşucu Triatlon ve İstanbul Salcono Triatlon Serilerine katılan 92 bireysel katılımcı ile gerçekleştirilmiştir. Veriler anket kullanılarak toplanmıştır. Verilerin analizinde Ki-kare testi kullanılmıştır. Triatlon atletleri tarafından en az bilinen doping türleri arasında kortikosteroidler, maskeleyici ajanlar, anti-östrojenik ajanlar, beta blokerler ve kanabinoidler vardır. Bunları peptit hormonları, narkotik analjezikler, anabolik androjenik steroidler ve uyarıcılar takip etmiştir.
Bulgular: Triatlon sporcularının yaklaşık üçte ikisi, sporcuların, antrenörlerin veyöneticilerin doping konusunda bilgilerinin yeterli olmadığını düşünmektedir..
Sonuç: Araştırmaya katılan sporcuların çoğunluğu, ilgili kurum ve kuruluşların dopingle yeterince mücadele etmediğini belirtmiştir.

Keywords: Triatlon, Triatloncular, Doping, Anti-Doping

INTRODUCTION

The doping in sport can be expressed as "a well-known phenomenon", dealt with various perspectives, including biomedical and social sciences (1). Since the advance of humanity, the psychology of competition, winning and gaining a competitive advantage is a widely observed behavior. The psychology of winning and being accepted in the community, which were present in primitive communities, continues in modern societies. However, this psychology now provides economic gains and social status. The psychology of winning and achieving a competitive advantage in sports has brought the need for more frequent, more intense and prolonged training. Although it is uncommon, some substances have been started to be taken by some athletes to improve performance in addition to physical and mental training. Over time, some performance-enhancing methods has been added to these substances. Today, some foreign substances are used in professional and amateur sports, causing significant improvements in social positions of athletes. However, drug abuse leads to serious problems for the sports and athletes. Due to economic reasons and sports materialism in recent years, sports authorities, coaches and athletes now focus on these substances, and an increase in unethical behaviors of athletes is observed as a result. Doping is among these unethical behaviors, and athletes believe that they can raise their sports performance by using these drugs (2). The doping substances used in sport to improve performance can be used for different purposes such as supporting muscle strength and improving athletic skills, increasing endurance, strength, resistance to fatigue or reducing nervous tension, depending on the relevant sports discipline (3).

Doping is a problem in the competitive world of sports for years. In general, doping is considered a behavior against the spirit of sports, causing unfair competitive advantage (4). The World Anti-Doping Agency (WADA) was established in 1999 to provide international cooperation on doping and allow athletes to compete on equal terms, and aims to make every effort to prevent doping and take every measures to save the spirit of sports in fighting against doping at the international level (5). The WADA Code, which is grounded on the World Anti-Doping Program, is a fundamental and universal document in sports. The Code describes the responsibilities of the relevant agencies in the fight against doping in sports as well as bringing compliance to the rules and policies in different countries and different sports. The Code also includes the compulsory documents as well. The Code is compatible with three other international standards, namely the "Testing, Laboratories, and Medical Use Exemption", for cooperation of the anti-doping organizations with the list of banned substances(6).

The list of prohibited substances and methods for athletes is updated and published by WADA annually. Anabolic androgenic steroids, other anabolic agents, peptide hormones, growth factors and other similar substances, Beta-2 agonists, hormone and metabolic modulators, diuretics and other masking agents, blood manipulation and the use of blood components, chemical and physical manipulations, gene doping constitute the class of prohibited substances and methods regardless of during or outside the competition. Stimulants, narcotics, cannabinoids and glucocorticosteroids are substances which are prohibited to be used in the competition. Alcohol and beta blockers are among the substances forbidden in certain branches of sports (7). Almost all doping substances cause short- or long-term adverse effects in the body. Especially the most widely used substances by athletes, such as testosterone, are known to cause complications such as heart attacks, benign and malignant tumor formation, liver dysfunction, and infertility. Some of the doping substances cause psychiatric diseases, such as psychosis. It is known that some of the athletes that use these substances lost their lifes after quitting the sports because of diseases occurred due to the use of these substances during their sports life (8).

This study aims to determine the knowledge of triathlon athletes on the types of doping used in sports as well as their opinions on the anti-doping matters.

MATERIALS AND METHODS

This descriptive study was conducted with 92 individuals participated in Taşucu Triathlon and İstanbul Salcano Triathlon Series, which was organized in 2015 by the Turkish Triathlon Federation. A 23-item questionnaire consisting of statements on personal information about athletes as well as the types of doping used in sports was used for data collection. Athletes were asked to answer by selecting one of the "Agree", "Disagree", and "Neither agree nor disagree" options regarding doping. The Cronbach's α value of the items was found to be 0.84. Statistical analyses were performed using a statistical software package, and descriptive analyses were presented with numbers and percentages, and Chi square test was used in the analysis of data. The p value of less than 0.05 was considered to show a statistically significant result.

RESULTS

In this section, knowledge levels of triathlon athletes on doping and their opinions on anti-doping matters are presented by demographic variables. Looking at the responses, regarding the type of doping, of the athletes participated in the study, the percentages of the "Neither agree nor disagree" responses given to the related expressions by the athletes were as follows: "mostly the stimulants are used in sports" by 41.3%, "mostly the narcotic analgesics are used in sports" by 59.8%,

"mostly the anabolic-androgenic steroids are used in sports" by 57.6%, "mostly the beta blockers are used in sports" by 75.0%, "mostly the peptide hormones are used in sports" by 67.4%, "mostly the masking agents are used in sports" by 81.5%, "mostly the cannabinoids are used in sports" by 68.5%, "mostly the corticosteroids are used in sports" by 84.8%, and "mostly the anti-estrogenic activity agents are used in sports" by 80.4% (Table 1).

Table 1. The distribution of level of knowledge of triathlon athletes about types of doping

	Agree		Disagree		Neither agree nor disagree	
	N	%	N	%	N	%
Mostly the stimulants (caffeine, cocaine) are used in sports	38	41.3	16	17.4	38	41.3
Mostly the narcotic analgesics (morphine) are used in sports	6	6.5	31	33.7	55	59.8
Mostly the anabolic-androgenic steroids are used in sports	27	29.3	12	13.0	53	57.6
Mostly the beta blockers are used in sports	9	9.8	14	15.2	69	75.0
Mostly the peptide hormones (erythropoietin, growth hormone, etc.) are used in sports	23	25.0	7	7.6	62	67.4
Mostly the masking agents are used in sports	10	10.9	7	7.6	75	81.5
Mostly cannabinoids (marijuana, etc.) are used in sports	4	4.3	25	27.2	63	68.5
Mostly the corticosteroids are used in sports	8	8.7	6	6.5	78	84.8
Mostly the anti-estrogenic activity agents are used in sports	10	10.9	8	8.7	74	80.4

Of the triathlon athletes participated in the study, 65.2% thought that doping is not known sufficiently by athletes, coaches and administrators. Of the athletes, 53.3% thought that they have adequate knowledge about doping, and 47.8% stated that they have read doping-related publications (Table 2).

Table 2. The distribution of opinions of triathlon athletes regarding the knowledge of doping

	Agree		Disagree	
	N	%	N	%
Doping is known by athletes, coaches and administrators adequately	32	34.8	60	65.2
I have adequate knowledge about doping	49	53.3	43	46.7
I read doping-related publications	44	47.8	48	52.2

In the examination of opinions of athletes on anti-doping matters, it's observed that the "Disagree" responses were the majority. Accordingly, 73.9% of the athletes thought that the government fails to fulfill its duty regarding doping prevention in sports, increasing awareness on damages of doping, unfair competition, and contradiction between doping and the spirit of sports. In the fight against doping, 80.4% of the athletes reported insufficient media coverage, 79.3% stated that activities of the federation is not sufficient, 78.3% reported that publications and activities of the doping control center is not sufficient, 79.3% reported that the efforts of the clubs are being adequate, 83.7% stated that activities of the Provincial Directorate of Youth Welfare and Sports are insufficient, and 66.3% reported that Olympic committee has insufficient number of publications and activities (Table 3).

Table 3. Distribution of opinions of triathlon athletes regarding the fight against doping

	Agree		Disagree	
	N	%	N	%
The government fulfills its duty regarding doping prevention in sports, increasing awareness on damages of doping, unfair competition, and contradiction between doping and the spirit of sports.	24	26.1	68	73.9
The media coverage on anti-doping matters is adequate	18	19.6	74	80.4
I'm satisfied with the anti-doping activities of the Federation	19	20.7	73	79.3
I'm satisfied with the anti-doping related publications and activities of the Doping Control Center	20	21.7	72	78.3
I'm satisfied with the activities of the clubs on the anti-doping matters	19	20.7	73	79.3
I'm satisfied with the anti-doping activities of the Provincial Directorate of Youth Welfare and Sports	15	16.3	77	83.7
I'm satisfied with the anti-doping activities of the Olympic Committee	31	33.7	61	66.3

Although the responses of athletes have similar distributions between female and male athletes, there were significant differences regarding age, educational levels, and sports age of the athletes.

When we examined the responses of athletes, a significant difference was found in the responses to the "Mostly the stimulants (caffeine, cocaine) are used in sports" statement in terms of age ($p<0.05$). Of the athletes who responded by the "Neither agree nor disagree" answer, 59.4% was in the 13-19 age group.

There was significant difference in the responses to the "Mostly the anabolic-androgenic steroids are used in sports" statement in terms of age, education level, and sports age ($p<0.05$). Of the athletes who answered by the "Neither agree nor disagree" answer, 78.1% was in the 13-19 age group. In line with this, 73.5% was secondary school-high school student, and the sports age of 72.7% was between 1 and 5 years.

There was a significant difference in the statement of "Mostly the beta blockers are used in sports" in terms of age and sports age of the athletes ($p<0.05$). Of the athletes who answered by "Neither agree nor disagree", 87.5% was in the 13-19 age group, and the sports age of 86.4% was between 1 and 5 years.

There was a significant difference in the responses to the "Mostly the peptide hormones (erythropoietin, growth hormone, etc.) are used in sports" statement in terms of age and sports age ($p<0.05$). Of the athletes who answered by "Neither agree nor disagree", 81.3% was in the 13-19 age group, and the sports age of 75.0% was 5 years and below.

There was also difference in terms of sports age in the responses given to the "Mostly cannabinoids (marijuana, etc.) are used in sports" statement ($p<0.05$). The sports age of 81.8% of the athletes who answered by "Neither agree nor disagree" was 5 years and below.

All of the college students gave the "Neither agree nor disagree" response to the "Mostly the anti-estrogenic agents are used in sports" statement ($p<0.05$).

The table 5 shown as, it's observed that there was no difference between the levels of knowledge of athletes in terms of age, gender, educational level and sports age.

As indicated in Table 6, there was no difference between the opinions of athletes on the anti-doping activities of relevant institutions and organizations in terms of gender and sports age of athletes ($p>0.05$), whereas a significant difference was found in terms of age and educational level of the athletes ($p<0.05$).

DISCUSSION

According to the levels of knowledge of the triathlon athletes on the types of doping (Table 1), the first five doping group, least known by triathlon athletes, were found to be corticosteroids, masking agents, anti-estrogenic agents, beta blockers, and cannabinoids respectively. These were followed by peptide hormones, narcotic analgesics, anabolic-androgenic steroids and stimulants. In a study by Lok et al. 38.8% of the students responded with "partially agree" to the statement of "Mostly the stimulants are used in sports", and 27.2% of the students responded "Mostly the anabolic-androgenic steroids are used in sports" statement with the "partially agree" answer (9). In Sertbaş et al.'s study,

32.2% of the athletes have responded "neither agree nor disagree" to "Mostly the stimulants, such as caffeine, cocaine are used in sports" statement (10). Dincer's study asked athletes about the types of doping, and the top five doping types, which athletes were undecided about, were found to be beta blockers, masking agents, anabolic-androgenic steroids, anti-estrogenic agents and steroids (11).

Approximately two thirds (65.2%) of triathlon athletes thinks that doping is not known sufficiently by athletes, coaches and administrators. In a study conducted by Gencturk et al. 38.2% of athletes has stated that doping is not sufficiently known by athletes, coaches and administrators, whereas this ratio was found to be 54.0% in Demir's study (12). In the same study, coaches were asked whether they were informed about performance-enhancing drugs, and 56% stated that they have adequate knowledge. In our study, more than half (53.3%) of the athletes expressed that they have adequate knowledge about doping (Table 2). However, as noted in Table 1, the majority of athletes has responded "have no idea" to the statements regarding types of doping. Contradiction in these findings suggests that athletes were unable to make realistic assessments about their level of knowledge. When we examined the studies conducted with athletes and physical education students, their results were found to be lower than our findings. The percentage of respondents who assessed their doping-related knowledge as adequate was 47.3% in Gencturk et al.'s study, 39.5% in Şirin's (thesis) study, 36.8% in Lok et al.'s study conducted with physical education students, 30.7% in Kurkcu et al.'s study, 27.5% in Şenel et al.'s study, 27.3% in Sertbaş et al.'s study and 27.0% in Özturk et al.'s study. In addition, results of studies of Dallı et al. Işık and Dincer were found to be lower than our findings (9–11, 13–16). In our study, nearly half (47.8%) of the athletes stated that they had read doping-related publications (Table 2). This percentage was found to be 34.2% in Dincer and Demir's study (11).

The majority of the athletes participated in the study stated that the relevant institutions and organizations are not fighting against doping adequately (Table 3). In a study by Gencturk et al. conducted with professional athletes, 35.5% of the athletes has stated that activities of doping-related institutions and organizations weren't enough (12). In Dincer and Demir's study 38.4% of the athletes believed that the government is failed to do its part in fighting against doping (11). In Demir's study, 60% of the respondents believed that government has no effective policy regarding the use of doping (17).

At Table 4, it is observed that types of doping are less known by the athletes in the 13-19 age group, studying at secondary and high schools, and have sports age less than 5 years. In Dincer's study, the knowledge about doping types has been investigated in terms of educational levels, and no significant difference was found according to sports age and level of education (11).

Table 4. The distribution of levels of knowledge of triathlon in terms of demographic variables

	Age	Gender	Education level	Spors age
Mostly the stimulants (caffeine, cocaine) are used in sports	0.037*	0.619	0.070	0.073
Mostly the narcotic analgesics (morphine) are used in sports	0.162	0.310	0.244	0.434
Mostly the anabolic-androgenic steroids are used in sports	0.002*	0.627	0.003*	0.005*
Mostly the beta blockers are used in sports	0.017*	0.803	0.072	0.012*
Mostly the peptide hormones (erythropoietin, growth hormone, etc.) are used in sports	0.017*	0.193	0.056	0.022*
Mostly the masking agents are used in sports	0.142	0.904	0.320	0.076
Mostly cannabinoids (marijuana, etc.) are used in sports	0.338	0.624	0.296	0.029*
Mostly the corticosteroids are used in sports	0.183	0.690	0.081	0.107
Mostly the anti-estrogenic activity agents are used in sports	0.056	0.228	0.018*	0.160.

There was no difference between the opinions of athletes regarding their doping-related knowledge in terms of age, gender, educational level and sports age (Table 5). Gencturk et al. didn't find any significant difference between status of reading doping-related materials in terms of sports age also Dincer and Demir, where a comparison was made between education levels and sports age, didn't find any significant difference. (11, 12). These results support our study findings.

Table 5. The distribution of opinions of triathlon athletes regarding the knowledge of doping in terms of demographic variables

	Age	Gender	Education level	Spors age
Doping is known by athletes, coaches and administrators adequately	0.187	0.521	0.615	0.454
I have adequate knowledge about doping	0.647	0.277	0.534	0.207
I read doping-related publications	0.568	0.654	0.163	0.016

There was no difference between the opinions of athletes on the anti-doping activities of relevant institutions and organizations in terms of gender and sports age of athletes, whereas a significant difference was found in terms of age and educational level of the athletes (Table 6). Similarly, there was no significant difference in terms of sports age in the study by Gencturk et al. (12). In Dincer and Demir's study, no significant difference was found in terms of educational levels and sports age of the athletes (11).

Table 6. Distribution of opinions of triathlon athletes on the anti-doping matters in terms of demographic variables

	Age	Gender	Education level	Spors age
The government fulfills its duty regarding doping prevention in sports, increasing awareness on damages of doping, unfair competition, and contradiction between doping and the spirit of sports.	0.000*	0.186	0.000*	0.092
The media coverage on anti-doping matters is adequate	0.131	0.213	0.044*	0.061
I'm satisfied with the anti-doping activities of the Federation	0.196	0.288	0.089	0.196
I'm satisfied with the anti-doping related publications and activities of the Doping Control Center	0.106	0.374	0.008*	0.264
I'm satisfied with the activities of the clubs on the anti-doping matters	0.832	0.925	0.315	0.092
I'm satisfied with the anti-doping activities of the Provincial Directorate of Youth Welfare and Sports	0.291	0.222	0.252	0.126
I'm satisfied with the anti-doping activities of the Olympic Committee	0.016*	0.834	0.017*	0.803

Consequently, triathlon athletes have insufficient knowledge about the types of doping used in the sports, and they consider the anti-doping activities of relevant institutions and organizations were not adequate.

Education is also important and necessary for sports as it is for every field. Training on the dangers of doping should be provided for the health and future of the athletes. In parallel to the anti-doping activities currently ongoing in the world, determination in putting the policies into effect, continuous training for all concerned parties and the public, dissemination of test, supporting scientific research, and re-drafting the anti-doping regulations within the framework of international rules should be among the goals to be performed within an institutional structure. Professional athletes should understand the anti-doping rules as well as the basic principles of the sports they have performed.

REFERENCES

1. Byers T, Edwards J. Why DON'T you dope?: a preliminary analysis of the factors which influence athletes decision NOT to dope in sport. Choregia Sport Manag Int J 2015;11:1-20.

2. Arazi H, Saeedi T, Sadeghi M. Prevalence Of Supplements Use and Knowledge Regard to Doping and Its Side Effects In Iranian Athlete University Students. Acta Kinesiol 2014;8:76–81.
3. Brzezianska E, Domanska D, Jegier A. Gene doping in sport–perspectives and risks. Biol Sport 2014;31:251–9.
4. Blank C, Leichtfried V, Fürhapter C et al. Doping in Sports: West-Austrian Sport Teachers' and Coaches' Knowledge, Attitude and Behavior. Dtsch Z Sportmed 2014:289–93.
5. Dost T. Doping. Türkiye Klin J Surg Med Sci 2006;46:145–51.
6. Duval A, Ram H, Viret M et al. The World Anti-Doping Code 2015: ASSER International Sports Law Blog smposium. Int Sport 2016:1-19.
7. Turkish Doping Control center. http://www.tdkm.hacettepe.edu.tr/english/.(Date accessed 2016-07-02).
8. Oguzhan Y, Cemal G. Sporda Ahlaki Bir Sorun Olarak Doping. Doğu Anadolu Bölgesi Araştırmaları 2007:128-34.
9. Lok S, Tasgın E, Temel V. A Comparison Study of University Students' Knowledge Levels about Doping Who Are Interested In Individual and Team Sport. Selçuk Univ J Phys Educ Sport Sci 2010;12:19–22.
10. Sertbaş K, Akdeniz H, Yılmaz A et al. Evaluation of ergogenic matter and doping usage knowledge of Turkish national athletes. Med Sport J Rom Sport Med Soc 2015;11:2591-600.
11. Dincer N, Demir H. The determination of knowledge levels related to doping in elite athletes. Turkish J Sport Excercise 2013;15:56-69.
12. Genctürk G. Elit Sporcularda Doping Bilgi Düzeyinin Ölçülmesine Yönelik Bir Araştırma (Güreş Örneği). Beden Egit Ve Spor Bilim Derg 2009;3:213-21.
13. Şirin E. Bireysel ve Takım Sporlarında Yer Alan Sporcuların Doping Hakkındaki Bilgi Düzeylerinin Belirlenmesi ve Karşılaştırılması. Selçuk Üniversitesi, 2001.
14. Kürkçü R. Farklı Branşlardaki Üniversiteli Sporcuların Ergojenik Yardımcılar Konusundaki Bilgi ve Yararlanma Düzeylerinin Araştırılması. NWSA Sport Sci 2009;4:198-209.
15. Ozturk EST. Doping in Turkey, assessment of knowledge level of players about doping (handball study case). Int J Hum Sci 2012;9:249-60.
16. Dalli M. Determination of Doping Knowledge Level of Physical Education and Sports College Students. Int J Sci Cult Sport 2014;2:11-20.
17. Demir A. Türkiye'de Durgunsu Kano ve Akarsu Kano Antrenörlerinin Sporda Dopingle İlgili Düşünce ve Bilgi Düzeylerinin Belirlenmesi. Harran Üniversitesi, 2012.